



## SOLUTIONS

### [DPP-06]

1. Mol fraction of the component A in vapour phase is  $x_1$  and mol fraction of component A in liquid mixture is  $x_2$  then ( $P_A^0$  = vapour pressure of pure A;  $P_B^0$  = vapour pressure of pure B). then total vapour pressure of the liquid mixture is-

(A)  $\frac{P_A^0 x_2}{x_1}$  (B)  $\frac{P_A^0 x_1}{x_2}$   
(C)  $\frac{P_B^0 x_1}{x_2}$  (D)  $\frac{P_B^0 x_2}{x_1}$

2. The lowering of vapour pressure of a solvent by addition of a non-volatile solute to it is directly proportional to:

- (A) The strength of the solution  
(B) The nature of the solute in the solution  
(C) The atmospheric pressure  
(D) All

3. The relative lowering of vapour pressure is equal to the mole fraction of the non-volatile solute, This statement was given by:

- (A) Raoult (B) Henry  
(C) Joule (D) Dalton

4. The vapour pressure of a solution having solid as solute and liquid as solvent is :

- (A) Directly proportional to mole fraction of the solvent  
(B) Inversely proportional to mole fraction of the solvent  
(C) Directly proportional to mole fraction of the solute  
(D) Inversely proportional to mole fraction of the solute

5. If  $P_0$  and  $P_s$  are the vapour pressure of solvent and its solution respectively.  $N_1$  and  $N_2$  are the mole fraction of solvent and solute respectively then:

(A)  $P_s = \frac{P_0}{N_2}$   
(B)  $P_0 - P_s = P_0 N_2$   
(C)  $P_s = P_0 N_2$   
(D)  $\frac{(P_0 - P_s)}{P_s} = \frac{N}{(N_1 + N_2)}$

6. One mol of non volatile solute is dissolved in two mol of water. The vapour pressure of the solution relative to that of water is

(A)  $\frac{2}{3}$  (B)  $\frac{1}{3}$   
(C)  $\frac{1}{2}$  (D)  $\frac{3}{2}$

7. The vapour pressure of a dilute aqueous solution of Glucose is 750 mm of mercury at 373 K. The mole fraction of solute is:

(A)  $\frac{1}{10}$  (B)  $\frac{1}{7.6}$   
(C)  $\frac{1}{35}$  (D)  $\frac{1}{76}$

8. The vapour pressure of water at room temperature is 23.8 mm of Hg. The vapour pressure of an aqueous solution of sucrose with mole fraction 0.1 is equal to:

(A) 23.9 mm Hg (B) 24.2 mm Hg  
(C) 21.42 mm Hg (D) 31.44 mm Hg

9. The vapour pressure of pure A is 10 torr and at the same temperature when 1g of B is dissolved in 20 gm of A, its vapour pressure is reduced to 9.0 torr. If the molecular mass of A is 200 amu, then the molecular mass of B is:

(A) 100 amu (B) 90 amu  
(C) 75 amu (D) 120 amu



10. The vapour pressure of benzene at  $90^{\circ}\text{C}$  is 1020 torr. A solution of 5 g of a solute in 58.5 g benzene has vapour pressure 990 torr. The molecular weight of the solute is?  
 (A) 220 (B) 120  
 (C) 320 (D) 222
11. The vapour pressure of a pure liquid solvent (X) is decreased to 0.60 atm. from 0.80 atm on addition of a non volatile substance (Y). The mole fraction of (Y) in the solution is:-  
 (A) 0.20 (B) 0.25  
 (C) 0.5 (D) 0.75
12. The vapour pressure of acetone at a certain temperature is 480 mm of Hg. A non-volatile, non-electrolyte solid weighing 0.2 g when added to 5.8g of acetone, the vapour pressure of the solution becomes 470mm of Hg. The molar mass of the solute is  
 (A) 170 g/mol (B) 94 g/mol  
 (C) 188 g/mol (D) 72 g/mol
13. The vapour pressure of benzene at a certain temperature is 640 mm of Hg. A non-volatile, non-electrolyte solid weighing 2.175 g when added to 39.08 g of benzene, the vapour pressure of the solution becomes 600 mm of Hg. The molecular weight of the solid substance is ?  
 (A) 69.45 (B) 59.6  
 (C) 49.50 (D) 79.8
14. The vapour pressure of  $\text{CCl}_4$  at  $25^{\circ}\text{C}$  is 143 mm Hg. If 0.5 g of a non- volatile solute (mol. Weight= 65) is dissolved in 100g  $\text{CCl}_4$ . The vapour pressure of the solution will be  
 (A) 199.34 mm Hg (B) 143.9 mm Hg  
 (C) 141.43 mm Hg (D) 94.39 mm Hg
15. According to Raoult's, the relative lowering of vapour pressure for a solution is equal to  
 (A) mole fraction of solute  
 (B) mole fraction of solvent  
 (C) moles of solute  
 (D) moles of solvent





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## ANSWERS

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1. (A)
2. (A)
3. (A)
4. (D)
5. (B)
6. (A)
7. (D)
8. (C)
9. (B)
10. (A)
11. (B)
12. (B)
13. (A)
14. (C)
15. (A)

